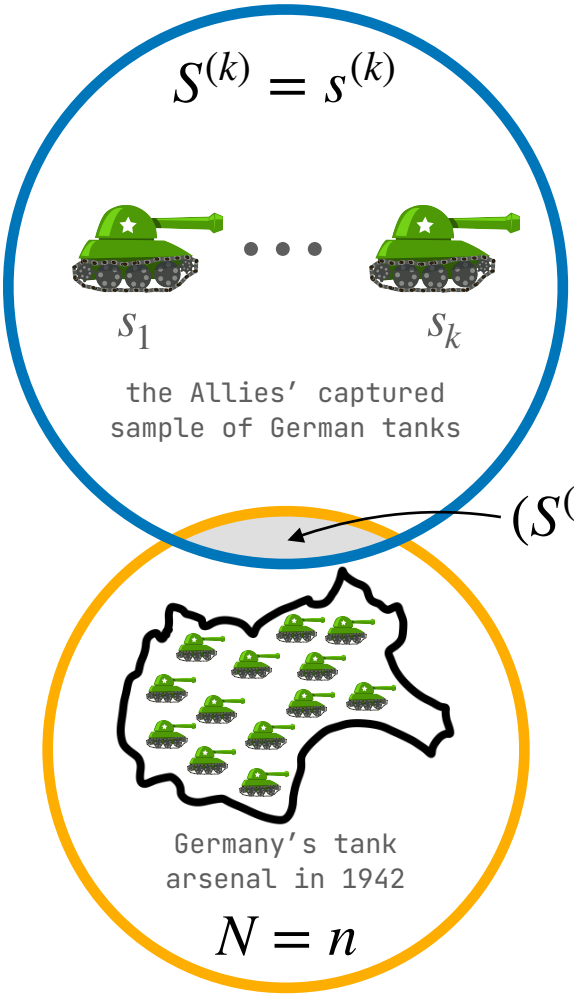

two statements of conditional probability:

$$\pi(N = n \mid S^{(k)} = s^{(k)}) = \frac{\pi[(S^{(k)} = s^{(k)}) \cap (N = n)]}{\pi(S^{(k)} = s^{(k)})}$$

$$\pi(S^{(k)} = s^{(k)} \mid N = n) = \frac{\pi[(S^{(k)} = s^{(k)}) \cap (N = n)]}{\pi(N = n)}$$

⇓

Bayes' theorem

$$\underset{\text{posterior}}{\pi(N = n \mid S^{(k)} = s^{(k)})} = \frac{\overset{\text{likelihood}}{\pi(S^{(k)} = s^{(k)} \mid N = n)} \overset{\text{prior}}{\pi(N = n)}}{\underset{\text{evidence}}{\pi(S^{(k)} = s^{(k)})}}$$